

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁵ : H04M 11/00	A1	(11) International Publication Number: WO 92/19065 (43) International Publication Date: 29 October 1992 (29.10.92)
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(21) International Application Number: PCT/US92/02689

(22) International Filing Date: 3 April 1992 (03.04.92)

(30) Priority data:
686,712 17 April 1991 (17.04.91) US

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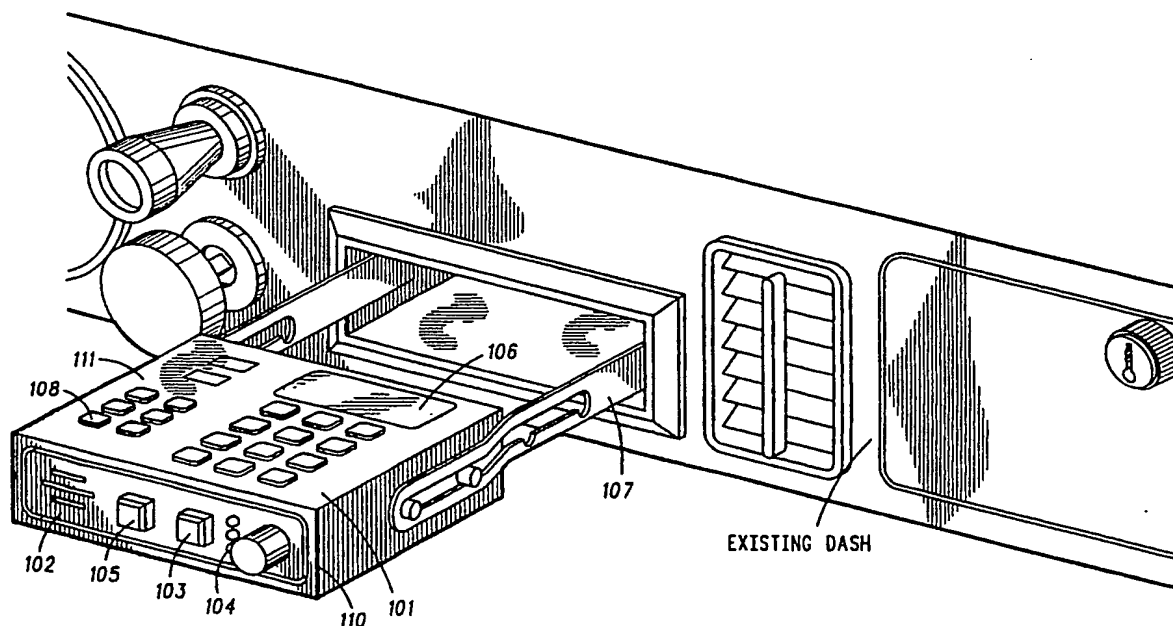
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(81) Designated States: CA, DE, JP.

Published
With international search report.

(54) Title: CONTROL APPARATUS FOR A MOBILE RADIOTELEPHONE



(57) Abstract

The radiotelephone control apparatus of the present invention is comprised of a number of status indicators (104) and control buttons (103 and 105) on one surface (110) as well as a microphone (102) for hands-free radiotelephone operation. A second surface (111) has a keypad (101) for entering data such as telephone numbers, a display (106) for displaying the entered data in addition to various other control buttons (108) to operate the radiotelephone. The apparatus is mounted in a recess of a vehicle instrument panel with the front surface exposed at all times, thus providing limited operation of the radiotelephone. The apparatus can be released from the recess, thereby exposing the surface having the more detailed radiotelephone controls.

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CONTROL APPARATUS FOR A MOBILE RADIOTELEPHONE

Field of the Invention

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The present invention relates generally to the field of communications and particularly to cellular radiotelephones.

Background of the Invention

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Mobile radiotelephones are typically mounted in the configuration of the control head located in the vehicle passenger compartment and the transceiver mounted remotely in the vehicle trunk. This presents the problem of where to
15 mount the control head for the convenience of the user and to require the least amount of space. Typical mounting locations are on a center console or on a stalk on the floor between the driver and front seat passenger. Both these configurations can be inconvenient for using the radiotelephone and require
20 space that can be used for other purposes. There is a resulting need for a radiotelephone controlling apparatus that requires minimal space and is convenient to use.

Summary of the Invention

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The control apparatus of the present invention is comprised of a plurality of status indicators, a keypad for entering data such as telephone numbers, a display for displaying the entered data, a microphone for hands-free operation, as well
30 as various other control buttons to operate the radiotelephone. The apparatus is mounted in a recess of a vehicle instrument panel. Certain of the features of the apparatus are in view at all times while others may be hidden while the apparatus is contained in the recess.

Brief Description of the Drawings

FIG. 1 shows a preferred embodiment of the control apparatus of the present invention.

FIG. 2 shows an alternate embodiment of the control apparatus of the present invention.

FIG. 3 shows a preferred embodiment of the control apparatus of the present invention in the stowed configuration.

FIG. 4 shows a block diagram of a typical radiotelephone in accordance with the present invention.

FIG. 5 shows another alternate embodiment of the control apparatus of the present invention.

FIG. 6 shows still another alternate embodiment of the control apparatus of the present invention.

FIG. 7 shows yet another alternate embodiment of the control apparatus of the present invention.

Detailed Description of the Preferred Embodiment

The control apparatus of the present invention can be stowed in a recess of a vehicle's instrument panel. When a call is to be made, certain radiotelephone control functions can be accomplished while in the recess or the apparatus can be repositioned to use the keypad and other expanded functions.

The control apparatus of the present invention, illustrated in FIG. 1, is comprised of a rectangular enclosure in the preferred embodiment. One surface (110) of the enclosure has a limited number of buttons and status indicators for quick operation of a radiotelephone. The buttons, in the preferred embodiment, include the off-hook button (103) and one or more quick dial buttons (105) for dialing, for example, emergency numbers. A quick dial button (105), in an alter-

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nate embodiment, can be used to redial the last number dialed. The status indicators (104), in the preferred embodiment, include: NO SERVICE, ROAM, and a power indicator. The indicators can be light emitting diodes (LEDs) or other
5 lights that are illuminated when those statuses are true. Additionally, this surface (110) has a microphone (102) for hands-free operation of the radiotelephone. By using this microphone (102) and an external speaker, for the received portion of a call, the radiotelephone user can conduct a call without holding a handset.
10

A second surface (111) of the enclosure contains a larger number of controls for more detailed operation of the radiotelephone. These controls, in the preferred embodiment, include a telephone keypad (101) for manually dialing a telephone number, memory access keys (108) for storing and recalling telephone numbers in the radiotelephone's memory, and a display (106) for displaying the dialed telephone number. This display (106) can be a light emitting diode display (LED), a liquid crystal display (LCD), or a vacuum florescent display (VFD).
15
20

The display (106) can also be used for displaying other information including names or labels associated with each memory location. The labels allow a user to associate a telephone number in memory with a name or subject. The display (106) can additionally indicate the same status functions that are on the front surface (110). This is accomplished by have the words ROAM, NO SERVICE, etc. in the display and only activated when those conditions are true.
25

The control apparatus of the present invention, in the preferred embodiment, is electrically coupled to a remotely mounted radiotelephone transceiver. This transceiver is typically mounted in the trunk of the vehicle.
30

The control apparatus is mounted on telescoping, locking slide brackets (107) in a recess in the instrument panel of

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the vehicle. The brackets (107) are spring loaded for moving the control apparatus into operating position from the recess. This mounting configuration is illustrated in FIG. 1.

While the control apparatus is stowed in the recess, as illustrated in FIG. 3, only the front surface is exposed. This allows the user to conduct limited radiotelephone operations such as answering a call by pushing the off-hook switch and using the hands-free microphone. In the recessed position, the user can also push a quick dial button to dial a preselected number and again use the microphone to communicate.

When expanded operation of the radiotelephone is required, the front of the apparatus can be pressed lightly. This releases the control apparatus and allows the spring loaded mounting system to reposition the control apparatus from the recess, thereby exposing the second surface containing the keypad, display, and other more detailed controls.

The control layout of the control apparatus may be as in the preferred embodiment illustrated in FIG. 1. FIG. 2 illustrates an alternate embodiment for the control layout having the display (201) to the side of the keypad (202) instead of above. This embodiment can be used for instrument panels that are not deep enough for the design of the preferred embodiment.

The cellular radiotelephone, as illustrated in FIG. 4, may be any conventional cellular telephone transceiver having a radio transmitter (401), radio receiver (402) and logic unit (403), such as the transceiver shown and described in Motorola instruction manual number 68P81066E40, entitled "DYNA T-A-C Cellular Mobile Telephone 800MHZ Transceiver". The hands-free microphone (102) is coupled to the transmitter portion (401) of the transceiver to provide the transmitted audio. The keypad (101) of the present invention enters data that is read by the microprocessor (403). This microprocessor (403) can also control the data displayed on the

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control apparatus' display (106) and lighting of the indicators (104) to indicate the transceiver's status.

Other alternate embodiments of the present invention can have the indicators and control buttons located on different surfaces of the control apparatus. Additionally, instead of
5 a spring loaded mounting bracket to move the apparatus into position, the apparatus can be pulled into position manually or can be released from the recess by pressing a release button. Yet another alternate embodiment of the present invention
10 can have a radiotelephone transceiver built into the control apparatus instead of mounted remotely. While a display is used in the preferred embodiment, an alternate embodiment would not have a display. Different shapes from the preferred embodiment's rectangular shape could also be used
15 without departing from the scope of the present invention. Alternate embodiments do not require a recess in the instrument panel.

FIGs. 5, 6, and 7 show alternate embodiments for stowing the control apparatus of the present invention in an instrument panel. If the control apparatus is mounted to the
20 instrument panel with a pivoting mount, the apparatus can be swung into the full operation position.

In summary, a radiotelephone control apparatus has been shown that is mounted in the instrument panel of a vehicle. The apparatus has a limited number of control functions
25 available in the stowed configuration but can be repositioned within the instrument panel for more detailed control of the radiotelephone. The control apparatus of the present invention, therefore, reduces the space required for radiotelephone
30 operation.

Claims

1. A radiotelephone control apparatus for use in a vehicle having an instrument panel with a recess, the apparatus
5 coupled to a radiotelephone transceiver having a plurality of statuses, the apparatus comprising:
- a) indication means for displaying the plurality of statuses;
 - b) control means for initiating a dialing function of the
10 radiotelephone transceiver;
 - c) data entry means for entering data to the radiotelephone transceiver; and
 - d) slidable mounting means, coupling the control apparatus to the recess, for allowing the control apparatus to move
15 from a first position at least partially in the recess to a second position.

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2. The apparatus of claim 1 and further including a display for displaying the data.
3. The apparatus of claim 1 and further including audio
5 transducer means for converting audio for transmission by the radiotelephone transceiver.
4. The apparatus of claim 1 and further including release
10 means for releasing the control apparatus from the first position.
5. A radiotelephone control apparatus, having a first surface and a second surface, for use in a vehicle having an instrument panel with a recess, the apparatus coupled to a remotely
15 mounted radiotelephone transceiver having a plurality of statuses, the apparatus comprising:
- a) first indication means, mounted on the first surface, for displaying the plurality of statuses;
 - b) control means, mounted on the first surface, for for
20 controlling an off-hook function of the radiotelephone transceiver;
 - c) data entry means, mounted on the second surface, for entering data to the radiotelephone transceiver, the data including a telephone number to be called by the radiotelephone
25 transceiver;
 - d) second indication means, mounted on the second surface, for displaying the data;
 - e) audio transducer means, mounted on the first surface, for converting audio for transmission by the radiotele-
30 phone transceiver; and
 - f) slidable mounting means, coupled to the apparatus, for allowing the apparatus to move from a stowed position, at least partially in the recess, to an extended position out of the recess, the stowed position exposing at least the first surface

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and the extended position exposing the first and second surfaces.

5 6. The apparatus of claim 5 wherein the first indication means are light emitting diodes and the plurality of statuses include power on, roaming, and no service.

7. The apparatus of claim 5 wherein the data entry means is a keypad.

10

8. The apparatus of claim 5 wherein the second indication means is a liquid crystal display.

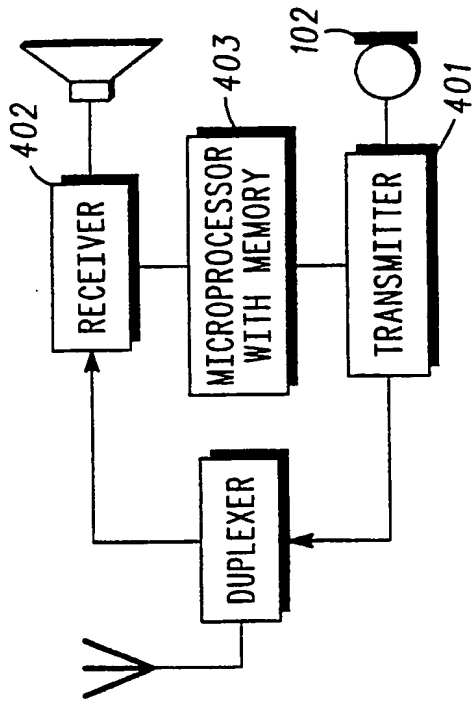


FIG. 4

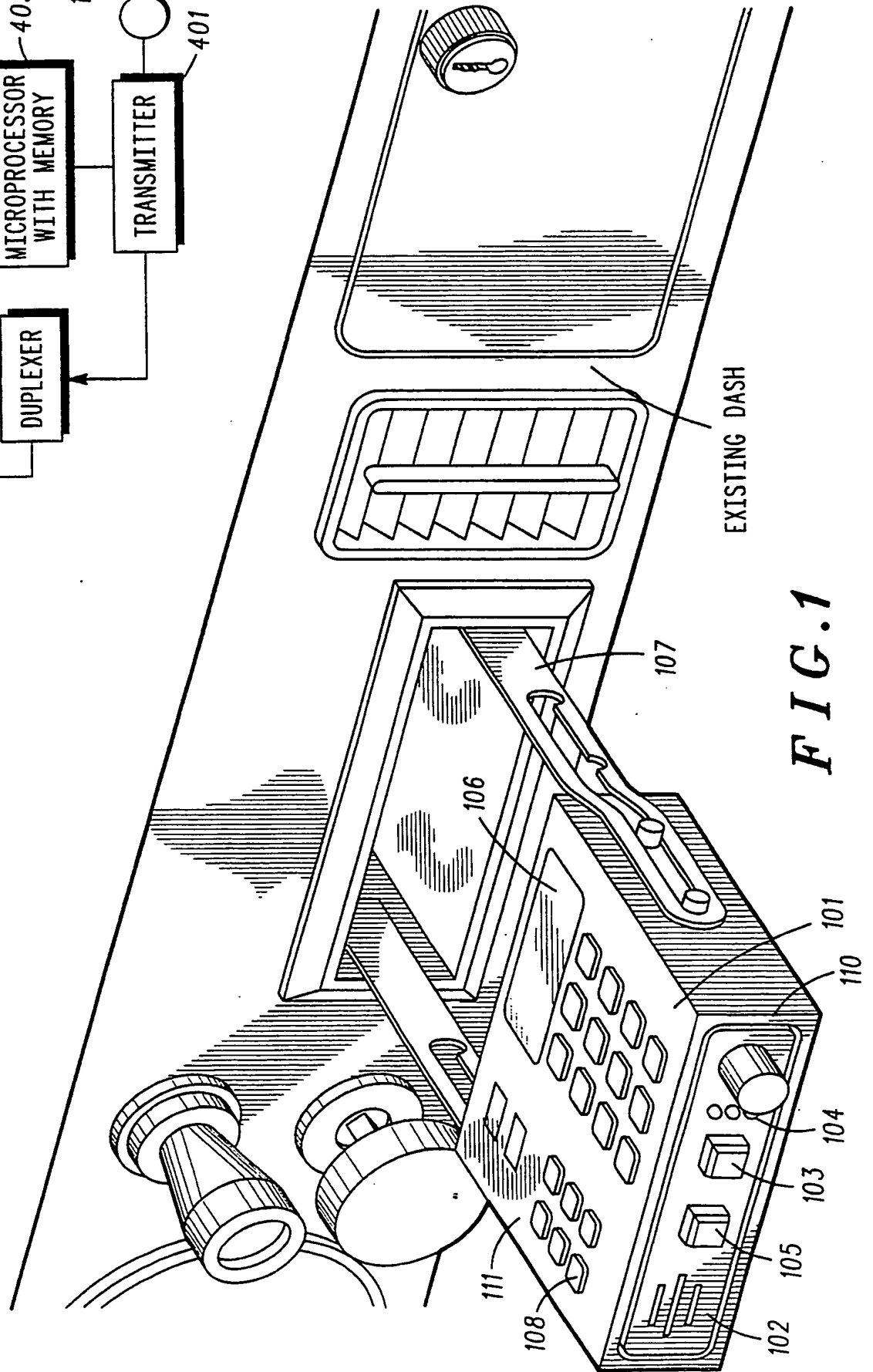


FIG. 1

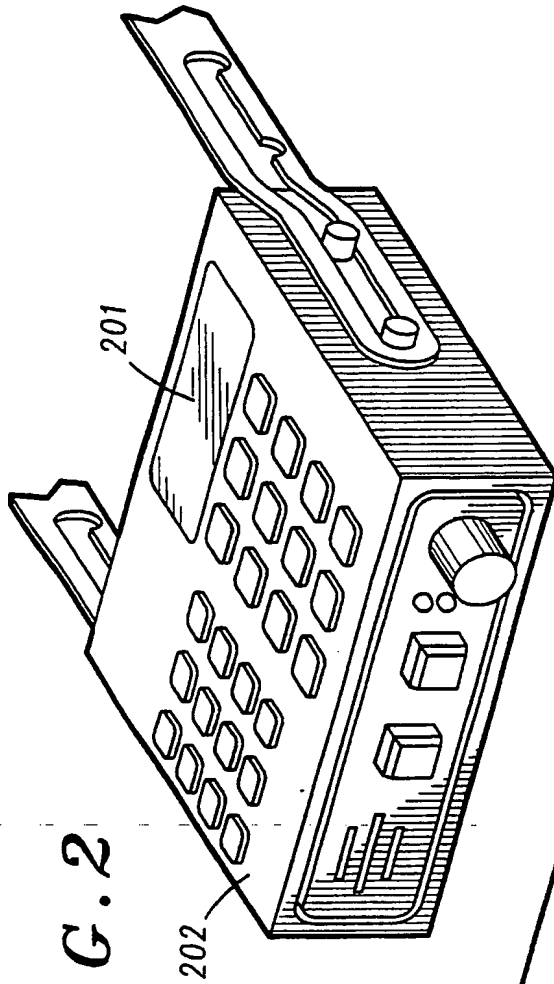


FIG. 2

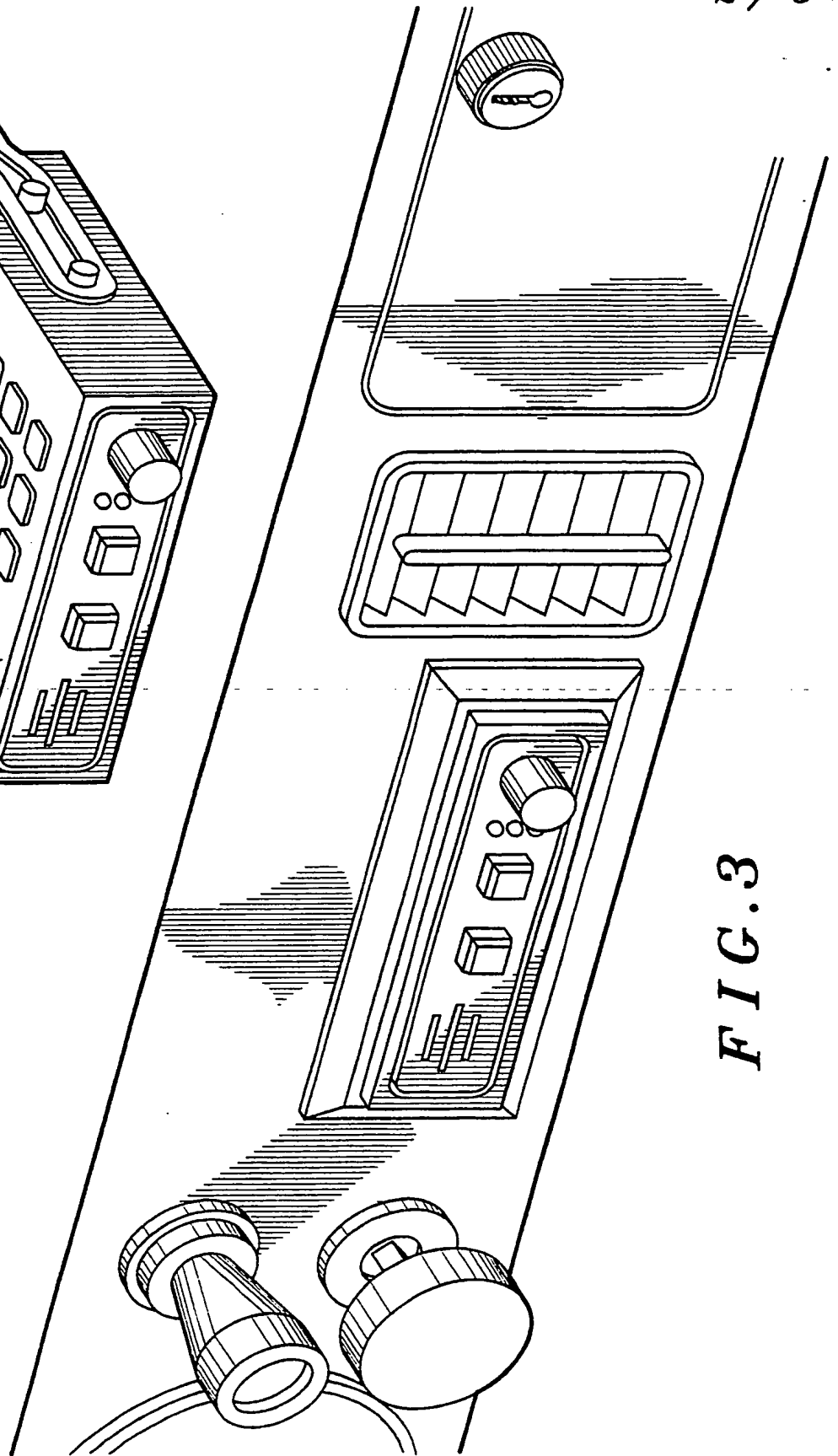
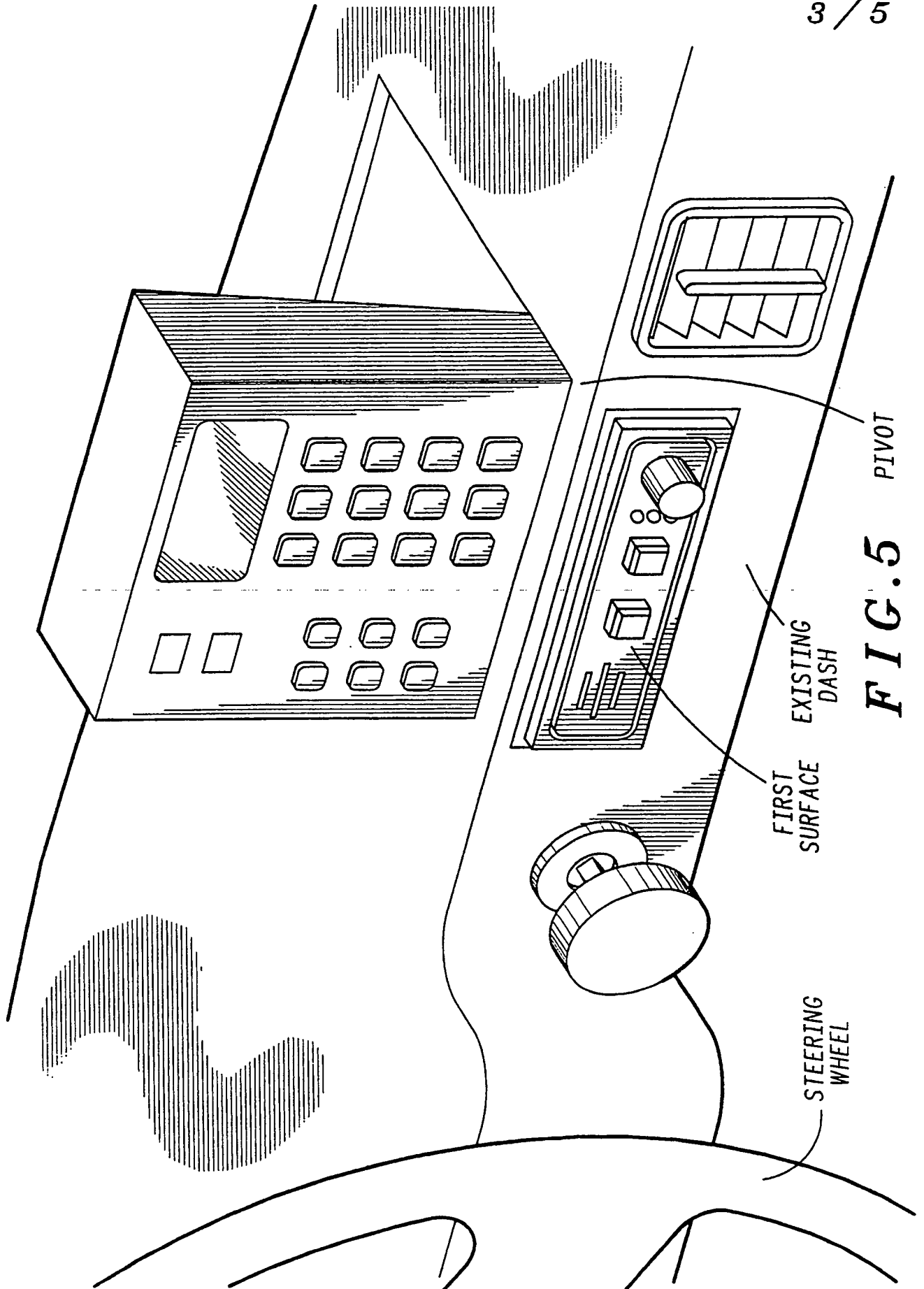


FIG. 3



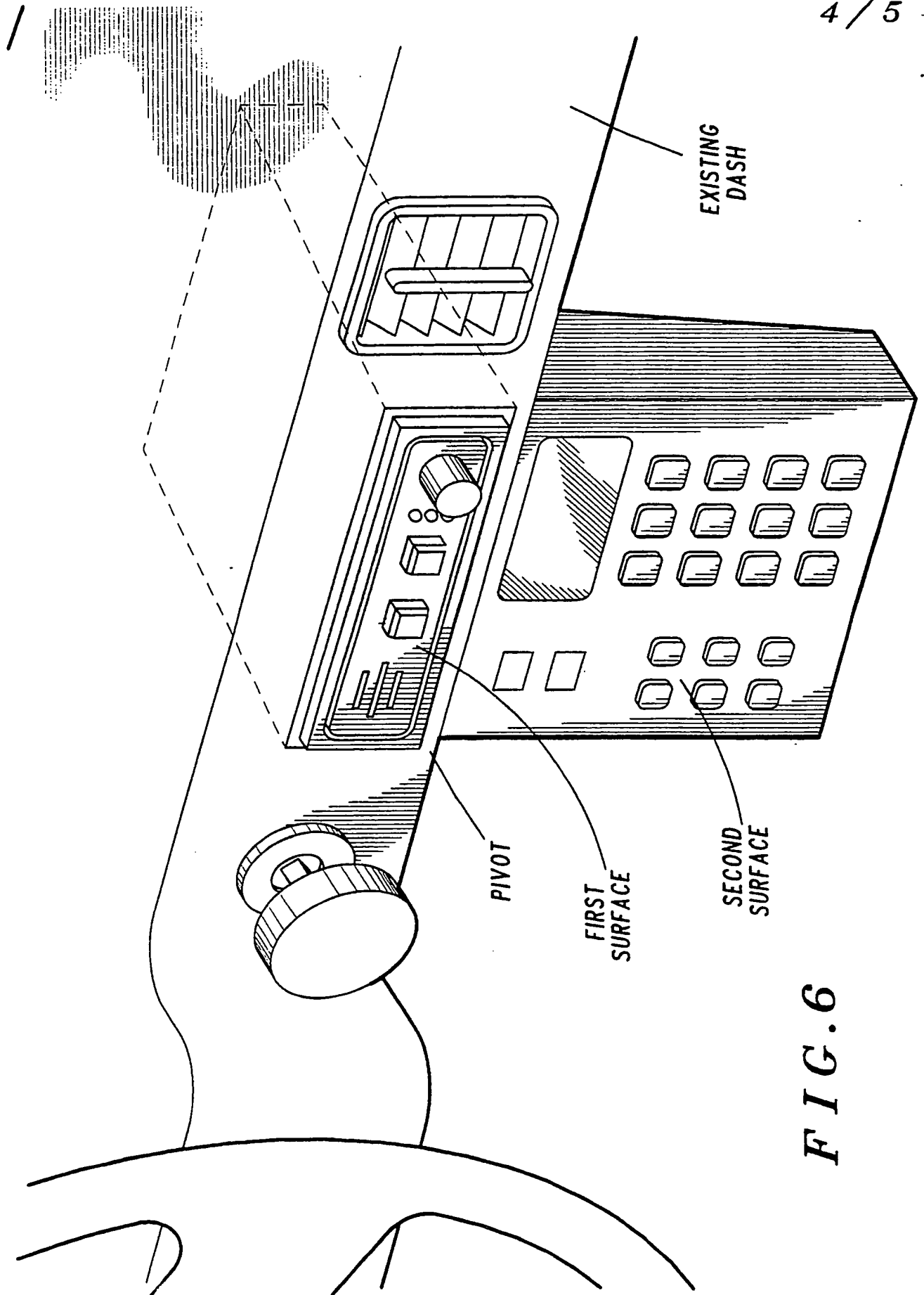


FIG. 6

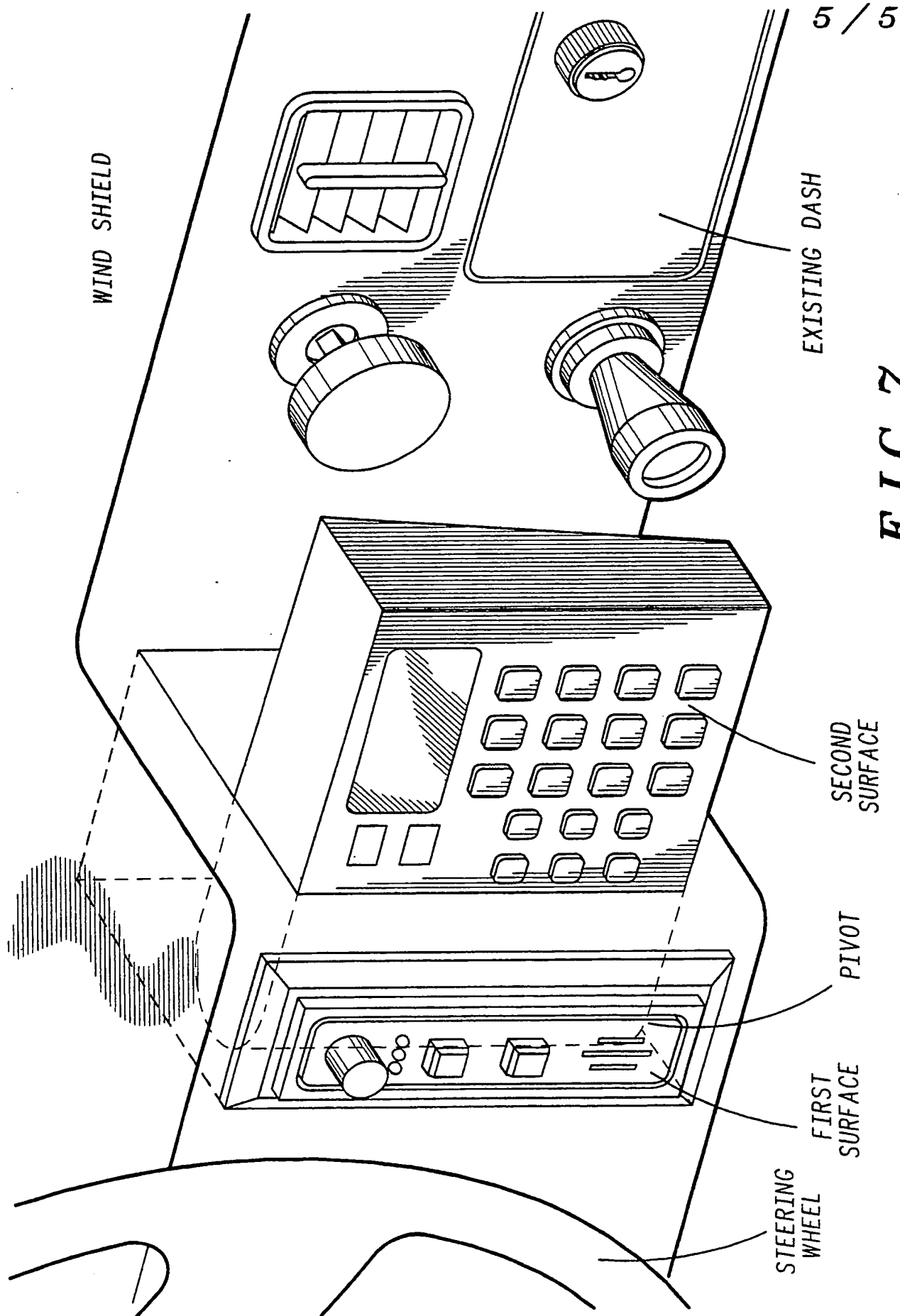


FIG. 7

INTERNATIONAL SEARCH REPORT

International Application No. PCT/US92/02689

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) ⁶ According to International Patent Classification (IPC) or to both National Classification and IPC IPC(5): H04M 11/00 US CL : 379/58														
II. FIELDS SEARCHED <div style="text-align: right; margin-right: 100px;">Minimum Documentation Searched ⁷</div> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 25%;">Classification System</th> <th style="width: 75%;">Classification Symbols</th> </tr> <tr> <td style="padding: 5px;">U.S.</td> <td style="padding: 5px;">379/58, 59, 60, 61, 62; 455/90</td> </tr> </table> <div style="text-align: center; margin-top: 5px;"> Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁸ </div>			Classification System	Classification Symbols	U.S.	379/58, 59, 60, 61, 62; 455/90								
Classification System	Classification Symbols													
U.S.	379/58, 59, 60, 61, 62; 455/90													
III. DOCUMENTS CONSIDERED TO BE RELEVANT ⁹ <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 10%;">Category [*]</th> <th style="width: 70%;">Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²</th> <th style="width: 20%;">Relevant to Claim No. ¹³</th> </tr> <tr> <td style="text-align: center; vertical-align: top; padding: 5px;">Y</td> <td style="padding: 5px;">WO, A, 90/07833 (LANG ET AL.) 12 JULY 1990, SEE ENTIRE DOCUMENT.</td> <td style="text-align: center; vertical-align: top; padding: 5px;">1,3,4,5,7</td> </tr> <tr> <td style="text-align: center; vertical-align: top; padding: 5px;">Y</td> <td style="padding: 5px;">US, A, 4,698,838 (ISHIKAWA ET AL.) 06 OCTOBER 1987, SEE FIG. 1, 2A, 2B.</td> <td style="text-align: center; vertical-align: top; padding: 5px;">5</td> </tr> <tr> <td style="text-align: center; vertical-align: top; padding: 5px;">Y</td> <td style="padding: 5px;">NEC ADVERTISEMENT, "OUR ECONOMY CAR PHONE COMES WITH MORE FEATURES THAN MOST ECONOMY CARS, COMPUTERS AND COMMUNICATIONS, PUBLISHED 1986, MAY (SEE P. 16)</td> <td style="text-align: center; vertical-align: top; padding: 5px;">1,2,5,6,8</td> </tr> </table>			Category [*]	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³	Y	WO, A, 90/07833 (LANG ET AL.) 12 JULY 1990, SEE ENTIRE DOCUMENT.	1,3,4,5,7	Y	US, A, 4,698,838 (ISHIKAWA ET AL.) 06 OCTOBER 1987, SEE FIG. 1, 2A, 2B.	5	Y	NEC ADVERTISEMENT, "OUR ECONOMY CAR PHONE COMES WITH MORE FEATURES THAN MOST ECONOMY CARS, COMPUTERS AND COMMUNICATIONS, PUBLISHED 1986, MAY (SEE P. 16)	1,2,5,6,8
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<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>[*] Special categories of cited documents: ¹⁰</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </div> <div style="width: 45%;"> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"G" document member of the same patent family</p> </div> </div>														
IV. CERTIFICATION <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 5px;"> Date of the Actual Completion of the International Search 16 JUNE 1992 </td> <td style="width: 50%; padding: 5px;"> Date of Mailing of this International Search Report <div style="font-size: 1.2em; font-weight: bold;">09 JUL 1992</div> </td> </tr> <tr> <td style="padding: 5px;"> International Searching Authority ISA/US </td> <td style="padding: 5px;"> Signature of Authorized Officer <div style="text-align: center;"> GEORGE J. OEHLING </div> </td> </tr> </table>			Date of the Actual Completion of the International Search 16 JUNE 1992	Date of Mailing of this International Search Report <div style="font-size: 1.2em; font-weight: bold;">09 JUL 1992</div>	International Searching Authority ISA/US	Signature of Authorized Officer <div style="text-align: center;"> GEORGE J. OEHLING </div>								
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